

# **Method for Initialization and Stepsize Control of Time-Domain Equalizer in Multi-carrier Communication System**

## **Abstract of the Disclosure**

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The present invention provides a method for initialization and stepsize control of a time-domain equalizer (TEQ) in a receiver of a multi-carrier communication system to upgrade the performance of adaptive TEQ algorithms. As to TEQ initialization, the Time-domain Window Mask  
10 method generates a modified channel impulse response (CIR) by performing a locate maximum energy algorithm and then applies a time-domain window mask to adjust the modified CIR to obtain an initial value of a target impulse response. Then, a dividing operation is performed on the frequency-domain initial target impulse response and the modified CIR to determine an initial  
15 value of the frequency-domain TEQ impulse response. The Head-tail Equalizing method also performs the locate maximum energy algorithm, and the remaining points other than the consecutive points with maximum energy are combined and padded zero to the last few points to generate a modified CIR. The reciprocal of the frequency-domain modified CIR is  
20 determined to be an initial value of the frequency-domain TEQ impulse response. The initial value of the frequency-domain target impulse response is determined by multiplying the determined frequency-domain TEQ impulse response with the frequency-domain of the CIR. The stepsize control method configures the stepsize coefficient as a time-varying  
25 coefficient during the whole adapting TEQ algorithm. It is smaller value at an early stage to prevent from divergence and becomes larger at a late adapting stage to prevent from slow convergence.